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08/432434

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US006001647A

United States Patent [19]

Peck et al.

[11] Patent Number: **6,001,647**[45] Date of Patent: ***Dec. 14, 1999**[54] **IN VITRO GROWTH OF FUNCTIONAL ISLETS OF LANGERHANS AND IN VIVO USES THEREOF**[75] Inventors: **Ammon B. Peck; Janet G. Cornelius**, both of Gainesville, Fla.[73] Assignee: **Ixion Biotechnology, Inc.**, Alachua, Fla.

[*] Notice: This patent is subject to a terminal disclaimer.

[21] Appl. No.: **08/547,746**[22] Filed: **Oct. 25, 1995****Related U.S. Application Data**

[63] Continuation-in-part of application No. 08/432,434, Apr. 28, 1995, abandoned, which is a continuation-in-part of application No. 08/234,071, Apr. 28, 1994, Pat. No. 5,834,308.

[51] Int. Cl.⁶ **C12N 5/00**[52] U.S. Cl. **435/325; 435/383; 435/384; 435/392**[58] Field of Search **435/325, 383, 435/384, 392**[56] **References Cited****U.S. PATENT DOCUMENTS**

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The subject invention concerns new methods which make it possible, for the first time, to grow functional islets in vitro cultures. The subject invention also concerns the use of the in vitro grown islet-like structures for implantation into a mammal for in vivo therapy of diabetes. The subject invention further concerns a process using the in vitro grown islet implants for growing an organ in vivo that has the same functional, morphological and histological characteristics as those observed in normal pancreatic tissue. The ability to grow these cells in vitro and organs in vivo opens up important new avenues for research and therapy relating to diabetes.

19 Claims, 11 Drawing Sheets